Menlo Park Notebook #41 [N-79-12-09]

This notebook covers the period December 1879-March 1880. It contains tables relating to tests on experimental lamps, numbers 141 to 973. Most of the entries are by Francis Jehl, but there are also occasional notes by other laboratory workers. Related material can be found in Menlo Park Notebook #19. The label on the front cover is marked "Lamps" and "Electric Light." The book contains 284 numbered pages.

Missing page numbers: 33-34, 121-122, 159-176, 247-248, 253-254, 257-264, 267-270, 275-276.

B R [redacted] Bones

Heff

ohms

thins

20

Micro ohms

ohms

hundred ohms

[redacted]

Geo Hill

LIBRARY OF THE

BOARD OF PATENT CONTROL,

120 Broadway, New York.

GENERAL ELECTRIC

May 1, 1896.

James Hill ... N.Y.

Prof Fehl Dec 9 18[redacted] Prof Fehl

Lamp no Prof Fehl Fehl

141 before heating 295 when used 157 ohms

142 ~~before heating 300 after 148 150~~

Heat Art after this 136

143 } ~~were heated for the~~

*144 } first time both were 152 ohms

P. J. Kinney ~~2281-NY~~

145 busted at the carbon connections after I received it from Bohm

Before Heating heated used off

*146 ~~This no 44~~ 132

147 300 ~~------~~ 195

148 270 busted at the clamp.

149 340 ------ 150

150 285 brought before meant to using and busted it. 117

151 275 ~~tried it in the evening~~ 160 thought it was a bad vacuum. it busted.

152 285 busted at the clamps while in pum

153 300 ------ 132

154 310 ------ 122

155 300 ------ 126

156 500 ------ 11

157 240 ------ 19

B

R

Bones

ohms

ohms

Micro ohms

20

ohms

Geo Hill

~~Geo Hill~~

Book for the ~~Remarks~~ of Lamps

Francis Jehl

~~Number of Lamps 604~~

Res 425 After Heating 845

James Hipple

Francis Jehl Menlo Park N.J.

113

Prof Jehl Dec 9 18 Prof Francis

Lamp no Prof Jehl Jehl

141 before heating 295 ohms when used 167

142 ~~bf heating~~ ~~300~~ ~~tested 148 150~~

Heat Act after this 136

143 } ~~were heated for the~~

*144 } first time both were 152 ohms

P. J. Kinney ~~2281 New York~~

145 busted at the carbon connections

after I received it from Pohl

132

195

154 310 —

155 300 — 12

156 500 — 11

157 340 — 19

Hill

Hill

Hill

Hill Hill

158	320	139
~~159~~	~~275~~	153
160	415	145
161	415	147
162	260	~~147~~
163	240	~~135~~
164	270	~~132~~
165	255	150
166	265	157
167	250	~~136~~
168	247	147
169	265 busted on the pump.	
170	265	157
171	250	142
172	235	~~135~~
173	Busted by Bohm	
174		
175		
176	285	167
177	245	155

~~178~~

179 — 250 — 19

180 — 250 — ~~Busted at [illegible]~~ — 1

181 — 245 — 152

182 — 255 — 160

183 — Busted By Bochu

184 — 245 — 14

185 — 240 — 132

186 — 275 — ~~155~~

187 — 235 — 128

188 — 240 — 142

189 — 270 — ~~149~~

190 — bn.

191 — 250 — 135

192 — 250 busted the clamps

193 230 — ~~134~~

194 — 121

age 3 years

~~Lamp [illegible]~~

Lamp No. 147 145 Ohms cold

Yellow

87. Volts

56 : 263 :: 21.4 :

1.33041
2.42008
8.27936
2.01001

102 Ohms

1.9317
1.9317
7.9910
1.6464
3.5188

3280 ft. lbs.

Lamp No. 147

92 Volts
20
122 Volts Machine

60 on resistance

276

60)27.6(
4.6

21.4
4.6
1284
856
98.44

98.44 Ohms

1.9638
1.9638
1.6464
8.0070
3.6810
.5185
.9375

3800 ft. lbs.

8.66 per H.P.

Lamp No 146 132 ohm

64 86 Volts

259

64 : 259 :: 21.4 :

1.3304
2.4133
8.1938
1.9375
.9345
.9345
1.2424
8.0525
1.5779

86.6 Ohms

3780 ft lbs

68.5 91 Volts
272

68.5 : 272 :: 21.4

1.3304
2.4346
8.1643
1.9293

85 Ohms

Lamp 146
82.6 Volts

61
248

61:248::21.4

1.3304
2.3945
8.2147
2.9396

87 ohms

1.9170
1.9170
1.6464
7.0604
2.5408
.5155
.9777

3470 ft. lbs.

9.5 per H. P.

Say 85 Ohms hot

~~145:100::135~~

Lamp 162

147 Ohms

88.6 Volts

58

266

104 Volts

58:266::21.4

104 ohms

141 ohms

1.3304
2.4249
8.2366
1.9919

98 Ohms

355 Volts

1.9474
1.9474
1.6464
8.0081
3.5497

3500

~~Rof Resistance After Exact~~
~~Before Date Diff~~
~~Lamp Heating Heat Temp~~
~~14 [illegible] 146 Jan 4 1879 4~~

Number of Lamp	Before Heating	After Sealing Off	Date	Remarks
196	265	117	16th	
197	250	~~145~~	"	
198	270	~~117~~	"	
199	270	145	"	
200	230	see Remark	"	Sealed off hot: after this
~~201~~	~~255~~	~~119~~		
202	225	see Remarks		
~~203~~	~~225~~	~~142~~		~~203 cold~~
~~204~~	~~245~~	~~230~~		
205	260	138		202+203 ~~several~~ gas jets
~~206~~	~~240~~	~~142~~ ~~[illegible]~~		~~about five hours~~
~~207~~	~~[illegible]~~	127		~~Carbon broken~~
208	370	162	17	Sealed off hot
209	270	147		
~~210~~	~~250~~	~~127~~		" "
~~211~~	~~270~~	~~159~~		
212	260	135		
213	280	125		
214	300	147		
215	250	Leaks by glass cracking on leading wires I think		
216	280			
218	240	124		
~~218~~	~~290~~	~~167~~		
219	225			
220	2[illegible]	1		
221	272	165		
~~222~~	~~252~~	~~147~~		
223	...	...		Broken at the clamps on the pump
~~224~~		~~109~~		

	Ohms before heating	Ohms after heating	
225.	225		Broke the glass around clamp The glass very thick
226	257		~~Oxydized.~~
No P.6 227	220	~~[illegible]~~ 127	~~[illegible]~~ Pump 6 70 mm
228 ″	260	~~170~~ 140	Pump 6 70 mm
~~229~~ ″	~~265~~	~~145~~	~~Pump 6 60~~
230 ″	225	125	Pump 6 60
231	247		4.393
232	235		Pump.6

		Pump	
233	230	6	{Inside Glass cracked {Bisted Bottom Broken Busted By
234	210	look for 334	150 after
~~235~~	~~220~~		
~~236~~	~~290~~	~~130~~	
237	250		Busted on pump
238	290		

L. K. Boehme

Boehme

Boehme

Boehm

L K Bal
Boehm

Lamp No	Resistance Before pumping	No of Pumps			Remarks
		Pumps	Resistance after Heating		
239	250	6			
~~240~~	~~290~~	~~6~~	~~124~~		
241	250	6	160		Vacuum 30
~~242~~	~~260~~	~~6~~	~~160~~		
243	260	6			Vacuum 65
~~244~~	~~255~~	~~6~~			
245	255		175		Broke on Crandil
246	220		140		Broke at clamp.

2

Number of Lamp	Resistance Before Pumping	No of Pump	Resistance after Heating		
247	260		135		
~~248~~	~~[illegible]~~		~~135~~		
249	250	6	160		Bubble up, wire leaks. Vacuum 65 — Vacuum got by Boehm
250	290	~~[illegible]~~ 6	125		" 65 6 "
251	280	5			not taken Vacuum
252	320	5			
253	280		140		
254	290		180		another pump on [illegible]
255	~~258~~	~~6~~	~~200~~		~~50 Vacuum~~ Boehm 5 old [illegible] on Chandelier
256	250				~~50 Vacuum~~
257	290	6	160		
258	250	6	160		Vacuum 65
259	270	6	150		
260	250		127		Boehm after Pump [illegible]

Number of Lamp	Resistance before pumping	Number of Burners	Resistance after treating	Date	
261	—	—	—	—	Busted By Boehm
262	—	—	—	—	Busted By Boehm
~~263~~	~~270~~	~~6~~	~~147~~		~~40 Vacuum~~
~~264~~	~~303'~~	~~6~~			
265	275	6	Carbon broke		~~43 Vacuum~~
266	234	6			Carbon broken on ~~pump~~
267	239	6			
269	—	—	—	—	Busted by Boehm
268	270	6		Dec 27	
~~270~~	~~240~~	~~6~~	~~140~~	"	~~Vacuum 140~~
271	270	6		"	
272	270	6		"	
273	182	6		29	Busted on pump with [illegible] clamps

Number of Lamp	Resistance before pumping	No. of Pumps	Resistance after heating	Date	Remarks
274	280	6		Dec 29	Vacuum 60
275	~~275~~		~~142~~	—	(~~Resistance before pumping~~ (may not be correct —
276	280	4		"	
277	280	4		"	
278	295	5		"	
279	295	5		"	
280	255	6		30	
281	280	6		"	
282	245	5		"	
283	262	5		"	
284	245	4	Ring Carbon +	"	Arch formed at clamp
285	155	4	+	"	
286	185	6	+	"	
287	177		+	"	Busted by Herrick

Number lamp	Resistance before pumping	No of pumps	Resistance after heating	Date	Remarks
288	273	6	|	"	horseshoe carbons
289	275	6	Bubble		in glass up platina wires
290	300	cracked in inside glass			
291	295	6		30	Farm 40
292	—	—	—	—	Broken before testing
29²	1st test —	6		"	Farm 40
294	155	6		"	
295	345	6	137	"	Farm 40 in office
296	250	5		"	Busted carbon on pump
297	342	5		"	
298	—	Inside glass broken by crack			
299	—				
300	284	6	145	Jan 2	Farm 30

No. of Lamps	Resistance before pumping	Volt Pump	Res. after heating	Date of pumping	Remarks
301	229	6		June 2	~~June 30~~
302	361				
303	265			"	
304	226		141	"	
305	255				Back glass exp. Carbon broke
306	250	6	157	"	
307	220	6		"	
308	242			"	
309	255			"	
310	247		140	Jun 3	
311	244		141	"	~~[illegible]~~
312	240		135		
313	289		158	"	14. Millimetres [illegible]
314			195	"	

No of Lamps	Resistance before pumping	No of pumps	Resistance after heating	Date	Remarks
315	345	5	230		
316	285	5	185		
317			144		
318	290	6	152		
319	245				
320	270	—	—	—	Glass cracked between clamps
321	275	—	—		Busted dont know how
322	264	—			
323	264	Ring Carbon			
324	—				
325	270	14	143		

36

37

No of Lamp	Resistance before pumping	No of pumps	Resistance after pumping	Date	Remarks
326	245			Jan 4	
327	290			"	
328	240		135	"	
329	250	6	146	"	Jaun 14 Centimetres
330	250	6	140	"	
331	200	5	145	"	~~4 1/2 Centimetres~~
332	200		112	Jan 5	~~Jaum 12 [illegible]~~
333	235		137	"	~~Carefully annealed~~
334	220		145	5	
335	201		113		Batchelor 195 bf.

No of Lamps	Resistance before pump	No of Pump	Resistance after pump	Date	Remarks
336	204		117	5	171 ~~Batchelor 6.~~
337				5	high Resistance
338	240	—	—	6	is one out of the new wide mould made
339	240			6	last night have ~~[illegible]~~ resistance 225 ohms
340	230		133	6	
341	250			Jan 6	
342	230		127	6	~~Vacuum 20 inch from top~~
343	260		147½	6	
344	170			6	Experiment form. Bucket
345	107		133	6	Enameled top
346	195			6	Cracked where joined together
347	210		127	6	
348	205		131	6	

No. of Lamp	Resistance before pumping	No. of Pump	Resistance after pumping	Date	Remarks
				Jan	
349	240	6	132	6	• Resistance of carbon 220
350	200	6	129	6	" " " ~~197~~
351	225		117		" " 197
352	225		122		" " " 210
353	245		135		
354	216		134		
355	267				" " " 255
356	237				Cracks badly " 228
357	219		168	7	Enameled Top
358	202		130	7	enameled enameled ~~compressed~~ "
359	187	10 6	121	7	carbon broke before pulling out of compressed 15 [illegible] action
360	229	6	125	7	Enameled tip

Number of Lamp	Resistance before heating	Number of pump	Resistance after heating	Date of pump	Remarks
				Jan	
361	209				Resistance of Carbon 200
362	225		172		207
363	187	glass cracked			between wires Carbon broke on pump 159
364	204	6	129	7	cracked glass between wires 15 millimetres Bored
365	182	6	120	7	[illegible] enamelled
366	200		130	″	
367	185			″	Cracked on pump
368	225			″	
369	270			8	Res. of Carbon 205 cracked at clamp
370	225	—	—	+	
371	272			8	Res of Carbon ~~276~~ 245
				9	
382	284		130		Atmospheric & Vacuum sealing
383	236				Atmospheric Vacuum sealing

44

325 143 (45)

Number of lamps	Resistance before heating	No. [illegible]	Resistance after heating	Date Blowing	Remarks
				Jan	
~~374~~	~~200~~	~~6~~	~~135~~	~~9~~	~~Long tips experiment~~
375	200	6	145	9	" " "
376	200		135	8	Bead on end of tips.
377	200	6	129	9	/
378	188	6	112	9	—
379	—	—	—	—	
380	158				—
381	200½				
382	—	—	—	—	Carbon busted a delay on pumps spoiled when another busted.
383	187				
384	338		~~114~~		too high resist. N.G.
384½	—		114		—
385	175				
386	200	cracked glass			Cracked while on the pump. They were nearly exhausted.
388					

Number of Lamp	Resistance before Pumping	No. of Pump	Resistance after heating	Date	Remarks
387	380			Jan	No good too much resistance
388	170				cracked glass . 386.
389	190				
390	220				
391	232				broke on pump owing to another busting
392	~~235~~		130		~~two~~ Carbon busted two makes 292 · 121 · Busted
393	225		124		Too high res. —
394	180		105		
395	191				
396	232				
397	237				Res. ~~too~~ high. ?
398	202				

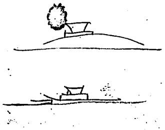
399	185
400	200
401	185
402	167
403	200
404	

Diminished Clamps

Burnished

Number of Lamps	Resistance before pumping	Resistance after pumping	Pump	Date	Remarks
399	185			Pm	
400	200	124	5	12	
401	185	118	5	13	
402	167				
403	200	142			~~Diminished Clamps~~ Aluminum Clamps
404	257		6		Blister on pump 6
405	222				
406	225				
407	229				
408	200				
409	136	x			
410	184	117			
411	185	132			
412	200	-	6		not marked
413	200		6		
414	192	147			

50



51

No of Lamp	Resistance before Pumping	Resistance after pumping	Pump	Date	Remarks.
415	184				
416	172				
417	190	131			
418	~~192~~				Taken down by [illegible] Before Res measured
419	136	128			
420		154			
421	215				
422	178				Busted on pump.
423	200				Platinum clamps only
424					Allumminum clamp
425					Platinum clamps clamps
426					Allumminum Clamps
427	181	188			
~~[illegible]~~					
428	203	145			

Number of lamp	Resistance before pumping	Resistance after pumping	Pump	date	Remarks
429	250			Jan	
430	239				
431	172				
432	~~175~~	152	4	18	another lamp is marked also 432 Carbon Broke 432
433	~~[illegible]~~				
434	180				
435	220				
436	201				
437	212				
438	200				
439	201				
440	195				
441	208	136			
442	207				

Numbers of Lamps	Resistance before pumping	Resistance after pumping	Pump	Volts	Remarks
443	190				
444	174				
445	198	145			
446	200				
447	200	157			
448	200	175			
449	180				Busted
450	218				
451	220				
452	184				
453	218				
454	209	158			
455	187				
456	182				
457	195				

No. of Lamp	Res before heating	Res after heating	to pump	Watt	
458	182				
459	195				
460	175				
461	210				Poor Vacuum
462	493				
463	201	167			after burning 3 hours bust at B. House also 466
464	200	144			
465	210				
466	210	146			see 463
467	181				
468	220				
469	182				
470	[illegible]				
471	175				
472	211				
473	195				
474	193				

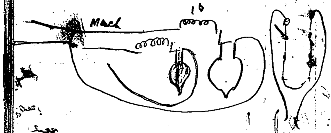
No of Lamp	Res before heating	Res after heating	Watts	Pump	Remarks
475	193				
476	190				
477	196				
478	172				
479	185				
480	220				[redacted]
481	192				
482	175				
483	189				
484	210	142			
485	182	125			
486	175				Carbon broke by being Taking from The rack! broke near The clamps after it was sealed off due to ~~[illegible]~~ bad usage. OO [illegible]
487	426				
488	170	136			
489	--				
490	[illegible]	130			
491	201	160			

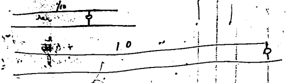
1/4 x 1/8
1/2 2 1/2
2 1/2 4/4
6 X 46 volts
624
12
4

No of Lamps	Res before heating	Res after heating	Date	Pump	Remarks
492	174	142			
493	220				was broke when I received it to be tested. F. J.
494	177	127			
495					Carbon Broke
496	196	143			
497	177	140			
498	165	145			
499	190	155			
500	80				This was that + 501 was that fine thread of vinnilla. the current was to strong for them so they broke broke about six oclock on Jan 28 1888 These were on Pump No 5 and were oxided by the air getting into the Pump.
501	40				
502	195	128			
503	200	151			
504	198				
505	200				
506	210	150			
507	200	135			
508	220	159			
509	235	165		✓	H.R
510	204	136			
511	210				leading [illegible] [illegible] by Broken to be fixed

62 10

H.O
10
1100





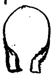
James
Lamp 555 Has on
the pump for about
five Hours

Francis Jehl

No of Lamp	Res before heating	Res after heating	Date	Pump	Remarks
512	—			6	Experiment — Got up one ~~[illegible]~~ a gas jet and the the glass burst.
513	—			6	Experiment
514	74				Experiment } Flax
515	950				} These two are Manilla.
516	850				} This one had an arc at the [illegible]
517	207	143		6	Busted by Bohm while trying to [illegible]
518	190	132		6	~~busted while~~ trying to fixed ~~in the wires~~
519	190	127			
520	220	149			George Carman trying to fixed the wires broke the carbon
521	370	Broke at the clamps			} These two were made by Mr B. on Jan 26 - made of ~~manilla~~ the bank note paper. This broke when I put it up in the pump. the glass creak.
522	290	230			no 1 pressed paper
523	170	145			
524	159	85 when Hot	giving 12 per H.P. 1 gas jets in full force		No 3 pressed paper broke when put
525	360	290		6	Burst at clamps. Both are Manilla paper
526	320			6	[illegible] one when I went [illegible] it was [illegible] at the carbon
527	232				
528	240	151			them were too tight
529	240	154		6	
530	1000				badly oxidized, these were
531	1000				
532	180	124		6	manilla lamps good ones H.V. put it up at half point [illegible] 20R
533	170	127		6	
534	200	142		6	~~carbon all. but a crack~~ in ~~the glass that~~ lets the carbon.

No of Lamp	R.A.H	H.A.H	Date	Rank	Remarks Francis Jehl
535	220				
536	185	133			
537	640				manilla fibre
538	600	average 384 hot			manilla fibre. This one, the glass crack and busted it & no 538
539	210	135			manilla paper
540	220	150			manilla paper. busted after being up about 8 houres.
541	800	570			The two busted after I put these on the main wire for twenty
542	1100	770			
543	270			6	Pressed manilla Busted by Bohm while sealing them in

No. of Lamp	B.H	W.H	Date	Amp	Remarks
544	270	220		6	Pressed mantles
545	205	142	}	5	These two lamps were of this shape
546	200	135		5	
547	305	175		6	
548	325				



No. of Lamp	B.H	A.H	Date	No. P	
549	200	135		6	These two are for Johnson
550	215	133		6	
551	550				Carbon Broken on the pump
552	470	350			
553	230	157			Johnson
554	230	145			

No of Lamp	Before heating	After heating	Bal	in Comp	Remarks
555	200	142		6	Johnson (Mr Johnson Johnson
556	220	148		6	for Johnson
557	350	200		6	
558	[illegible]			6	C. H.

f lag 464 4

6 4

6

210 R.

320

700
150

No. of Lamp	Before Heating	After Heating	[illegible]	[illegible]	Remarks
559	250			6	C. H.
560	410				Italian flax
561	very bright R. over 1000				Italian flax
562	210				

No of Lamp	B.H.	A.H	Date	No of Pump	Remarks
563	190	154			
564	265				
565	151				Register missed (taken of the pump by Carl (He says that they leaked) but as Bohm broke them open to put them on another pump. the vacuum destroyed them.
566	300				Same note missed (see) 565

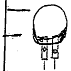
Francis Jehl

No. of Lamp	B.H.	a.H.	Date	No. of [illegible]	Remark
567	220	165		6	this one when I measured it was 260 then I measured it from the copper wires (it before was in a stand) and it was 165 / showing bad connection.
568	33				~~Manila Hemp~~ Manilla Hemp fiber Tissue paper arcs are formed at the end of one of the clamps
569	282				Bank note pressed Mr Edison tried it, he put the current on until we got a 500 jet, and after a few minutes it broke at the clamps, an arc being formed
570	209				(Guess it is hemp tow & lamp black also) so was the paper marked)

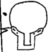
571	360		in lump. tissue paper ends 2 Broke at the end of the clamps when the current was put on
572	202		Arc formed at one of the clamps.
573	185	122	
574	184	138	

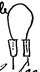
No of Lamp	B. H	a. H	Sub	To Hg
575	220	179		
576	[illegible]	167		
577	210	145		
578	200	165		
579	220	164		
580	216	147		
581	175	125		
582	200			
583	305			

had a very good vacuum on this pair but they did not give much light.

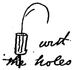


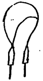
paper split and the fibre pressed in same

	Res	A Heat	DATE	[illegible]	
584	335				 Fibre threaded through and pressed together tight
585	350				Same
586	225/64				
587	208				The glass that hold the wires break while on pump
588	210*			β	twisted fiber
589	200			φ	twisted fiber are at the clamps

No LAMP	RES	RAH	DATE	PUMP	Remarks
590	510			6	*Carbon Broke on the pump at ~~the~~ one of the clamps an are ~~was~~ formed (fiber. new style 
591	510			6	* Carbon Broke at the clamp
592	550	427		4	*
593	520	345		4	* New style clamps fiber
594	600	295		6	*

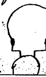
No of Lamp	RES	RAH	DATE	No of PUMP	Remarks
95	480	308		6	
576	208				
597	230				
598	185	133			
599	550	350			(fibre) (~~[illegible]~~ Graphite clamps) '01 Wire to clamp — clamp drilled & pushed on wire — Carbon wedged in with small piece —

No of Lamp	B H	A H	DATE	No of Pump	Remarks
600	650	370			Fibre (Clamps of Graphite drilled and pushed on wire) ·01 wire to clamps. Carbon wedged in with small piece
601	1180				 Pt clamps with a little plumbago in the holes. ·020 wires when the current was put on ~~with~~ for the first time it was taken out of the clamps
602	720	457			·010 Wires — Graphite clamps — clamps drilled and pushed on wire — carbon wedged in with small piece
603	470	280			~~Carbon~~ (Graphite clamps. —) Wallace Carbons .010 wires — & Carbon Slatter on wires
604	820	450			Carbons wedged in with small pieces

No. of Lamp	B.H.	A.H.	DATE	No. of Pump	Remark
605	669	370			Wallace Carbon clamp Soaked in olive oil 10 thousand Wire Carbon Wedged in by Small Pieces
606					
607	520	420		6	Fibre (Manilla) — Lignum Vitae clamps Carbonized with fibre 
608	800	505			Fibre (Manilla) Lignum Vitae clamps. Carbonized with fibre
609	629			6	Fiber (manilla) Lignum vitae clamps Carbonized With fiber.

No. 2 LAMP	B.H.	A.H.	DATE	D No. of Pump	Remark
610	172	129			
611	210	147			
612	210	147			
613	212	153			
614	215	158			

No of LAMP	B.H	A.H	DATE	No of PUMP	Remark
615					Knocked off Table while being measured cardboard Horseshoe. platinum clamps. which is d-d carlessness.
616	200	130			
617	230				
618	220				
619	222				

No. of LAMP	B.H.	A.H.	DATE	No. of PUMP	Remark
620	190	130			
621	191	150			
622	548				
623	470				Manilla fibre. — Small cocoa nut clamps — wide apart — clamps pushed on platina wires — $\frac{10}{1000}$ wires — arc at the clamps
624	550				Manilla fibre — Lignum Vitae clamp pushed on wire — $\frac{3}{4}$ apart (the  current ~~the~~ when put on, put a clamp out of the Rt wire

No. of Lamp	B.H	A.H	DATE	No. of Pump	Remark
625	220.				Broke on the pump Bursted the small globe in side #1
626	358	267			Lignum vitae
627					
628	200				Air are at The clamps.
629	210	127			

No. of Lamp	B.H	A.H	DATE	No. of Pump	Remark
630	252				Cocoa nut Clamp manilla fiber 2 $\frac{3}{1000}$ Wire
631					manilla fiber Lignum Vitae $\frac{3}{100}$ Wire wire burnt with batteries & glass bulb inside cracked by melted wire when current was put on.
632					Lignum Vitae Clamps 2 $\frac{3}{1000}$ Wire to heat clamp manilla hemp fiber it Broke after Burning 5 minuts
633	500				manilla fiber Cocoa nut ~~ends~~ ends new wire clamps
634	420				

102

103

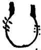
No of Lamp	B.H.	A.H.	DATE	No of Pump	Remarks
635	650	342			
636	645	410			
637	370				Cocoa nut Clamps Cocoa nut Fiber ~~Could not get a vacua~~
638	—				Manilla fibre tooo thick 1 in long in ~~Cocoa nut~~ Lignum Vitae Clamp
639	—	300			Cocoa Nut Clamps.- Cocoa Nut Fibre.-

No of LAMP	B.H	A.H	DATE	PUMP	Remark
640					Cocoa Nut Clamp. Cocoa Nut Fibre.
641					Cocoa Nut Clamp. Cocoa Nut Fibre. inside glass Broke on the pump after being heated several times
642	210	144			those have bin on the gas New paper
643	223	162			New paper
644	456				Card Board Horseshoe Platinum Clamp.

No of LAMP	B.H	A.H	DATE	PUMP	Remark
645	200				
646		379			Cocoa Nut Clamps and " " Fibre. – Oxidized –
647					Cocoa Nut Clamps and " " Fibre Broken by Hammer
648					New Paper 15/1000 Ω Two bad spots.
649					New Paper 15/1000

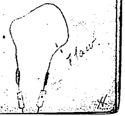
No of LAMP	B.H	A.H	DATE	PUMP	Remark
645	200				
646		379			Cocoa Nut Clamps and " " Fibre. – Oxodized –
647					Cocoa Nut Clamps and " " Fibre Broken by Hammer
648					New Paper 15/1000 Ω Two bad spots.
649					New Paper 15/1000

No of LAMP	B.H	A.H	DATE	PUMP	Remark
650		650		6	Manilla Fibre Cocoanut Clamps 4½ in long before Carbonized 7/1000 thick " "
651	250	2[illegible]		4	Small Loops — √652 ~~653~~ Cut from 13/1000 Paper- high Resistance but put on the pump
652	290	270		4	
653	720			4	Small Loops made from same as 654.655 measure about 600 ohms But put on the pump
654	780			4	Bad spots in Carbon regidued with 655



No of Pump	B.H.	A.H.	DATE	Pump	Remark
655	750			6	Two large loops (654 & 650) cut from reg. mould .015 paper — 6000 Ohms not able to account for such high resistance, we put them on the pumps
656	750			6	they measure above 600 ohms but put them on & see if it pump will Bring them down .015 paper
657					Made from .015 paper Uncalendered — and as they are about 600 Ohms we put them on pump to see if they will come down, Feb 13-1880,
658					Small loop — 300 R. — coated all over with Alumina finely powdered and mixed with alcho-hol — put on with brush Feb 13-1880
659	175				Small loop made from .015 Uncalendered paper to be blown in large light for experiment — Feb 13 High Res. —

No of Lamp	B.H.	A.H.	DATE	No. of Pump	Remark
660		78			Bass Fibre - 3 in long. 014 thick nearly round - Shrinks -
661					
662		230			
663					Broke at the clamp on pump at the first heating
664	395.		Feb 14.	4.	Rice Straw, Cocoa nut clamps.



H.

No of Lamp.	Before Heating	After Heating	Date.	Pump.	Remarks
665.	299.	—	Feb 14.	4.	Small loop - from pressed paper - coated with Zirconium Ox. Leak in inside bulb. H.
666.					Same as 664 small loop from pressed paper - about 800 Ohms coated with Zirconium Ox.
667.	320			6	This one was ~~then~~ put on after 668 [illegible] ~~[illegible]~~ Tried in N and oxydized
668.	5 60 8	R175		6	(This one was put on the pump for Upton [illegible], to put N in it, but it cracked very badly.) put in new bulb
669.	R.250	160			Smoked over camphor Old small loops from 6½ M -
670.	260	166			Old small loop made from 6½ M - about 250 Ω

W. J. Hammer

Y

For Vacuums
of this Lamp
wat no good

No. of Lamp	Before Heating	After Heating	Date	Pump	Remarks
671	142	93	Feb 17.	4	Ordinary Small loops soaked in Sugar. Glossy - pressed paper
672	113	81.		6	first two sugared
673	113	80.		6	the same as 672
674	87				Small sugared before cutting This Lamp was used for Nitrogen Experiment carbon broke after some successful tests.
675	97	73.	19.	4.	Small - sugared before cutting. All stuck together see B's book

No of Lamp	Before Heating	After Heating	Date	Pump	Remarks
676	101	70			Small sugared after cutting.
677	98				Small sugared after cutting. in side globe broke on the pump with high vacuum
678	87	61			Small sugared after cutting.
679	95	65			Small sugared after cutting.
680	17.3		Feb. 18.	4	Small. cocoa nut shell.

Hammer

No. of Lamp	Before Heating	After Heating	Date	Pump	Remarks.
681	93.	57	Feb. 18.	4.	Small loop, sugar coated before cutting, Carbonized between nickle plates.
682	202	103			Broke while getting sealed off put in new bulb— the same as 683
683	92	60			Small loops of Carbon
684	334	290			Bunch of Jute Fibers
685	520				Bunch of Jute Fibers

No. of Lamp	Before Heating	After Heating	Date	Pump	Remarks
686	371.	320			Jute fibre bunch
687	337.	~~[illegible]~~ 295			Bast fibre – 4. in. long. .014. thick.
688	253				Bunch of Jute – fine – Carbon has Bad Spots all over –
689	440				Large bunch fine Jute [illegible] Bad carbon it would not give a good light
690	143				Small Jute fine Arc formed at clamp & carbon broke

No. of Lamp	Before Heating	After Heating	Date	Pump	Remark
691	115				Large Braided Jute 3 Strands
692	181	150		5	Bast Fibre 5 in x .014
693	156			6	Jute Fibre plaited 3 Strands Arc formed at clamp at first Heating
694	[illegible]	223			Bast Fibre 5 X .014
695	119 R188 Last Lamp	[illegible]		6 6	first 695 Jute Fibre plaited 3 Strands Arc formed at clamp at first Heating

No of Lamp	Resistance Before Heating	After Heating	Date	Pump	Remarks.
696	163	136		6	Large Bass Fiber
697					Given wrong number by mistake. ~~Regular Carbon Broke while being pup on pump by F.R.U.~~
698	130				Jute fibre, 3 strands plaited. 3 large loops uncalendered paper .010 thick soaked in sugar (weak sol) Res, after carbonized 169 Ⓡ
699	160			6	Regular Carbon Nitrogen Ex Broke on the pump when Heated
700	16.9.	147			Large Loop. uncalendered paper .010. in thick, soaked in weak sol, sug. before cutting.

No of Lamp	Before Heating	After Heating	DATE	Pump	Remarks
701		148			Large globe Broken by falling on the floor. Large paper impressed Broken [illegible] after going to phl.
702	293	190			Bast-Fibre 5 X .014
703		850			Six Manilla Fibres .002 thick - laid straight together -
704	470	400			Bast Fibre - 5 X .014
705		225			Bass Fiber

W. J. Hammer

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
706	156	141			Regular Carbon Sugared
707	160	142			Regular Carbon Sugared
708	180	144			Regular Carbon Sugared
709	185				Regular Carbon Sugared ~~Carbon oxydise for~~ ~~[illegible] five minutes~~ oxydise When Heated on the pump
710	180				Regular Carbon Sugared Tried in N. Lasted about one minute at atmosphere pressure Carbon Broke on the pump

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
711	160				Regular & Sugared oxydise and Broke the carbon they were on pump ~~&~~ five hours
712	170				Regular & Sugared oxydise and Broke the carbon Was on pump about five hours
713	190	143			Regular & Sugared Bad Spot in Carbon
714	180	135			Regular Sugared
715	180	112			Regular - Sugared

No of - Lamp.	Before - Heating -	After - Heating -	Date -	Pump -	Notes -
716.	200	146			Sugared Regular-
717.	200				Sugared - Cards about 200 Ohms.
718.	114		Feb. 23.	4	Jute Fiber- Plaited - Platinum Wire fastened to Jute By Winding Round with Jute the ends Boiled in Sugar- carb 63 [illegible].
719.	206				~~Carb 64 Bass Fiber -- 5X.011~~ ~~Shaped By Heat ends~~ Carb 64 Bass Fiber -- 5X.011 - Soaked in Sugar- Shaped Before Carbonizing Carbon Broke When current was put on the first time
720.	109		Feb 13.	4	Carb 66 Jute Fiber - Plaited wet Shaped By Heat ends cut and Sugared Arc formed at clamp.

No of - Lamp.	Before-Heating-	After-Heating-	Date-	Pump!	-Notes-
721.	105				Carb 62 Plaited Jute Fibers soaked in thin Sugar when the Clamps Cate[illegible] it Arc formed at clamp just before sealing off (clamp red Hot)
722.	125				Large Loops Cut from 010 — Sugared in Standard Solution
723.					Resistance very high and Would not put on pump Bad Connection on ~~Clamp~~ Wire one Wire not Soldered
724.	170				Large Loops Cut from '010 Sugared in Standard Solution
725.	447				High Res, Large Loops made from Sugar Sol, 0 — Broken Carbon by Glassblower when put in bulb

o of - Lamp-	Before-Heating-	After-Heating-	-Date-	-Pump-	-Notes-
726.					High Res large loops made from sugar sol, 0 = Carbon Broken by Glassblower
727.	2/5	160	Feby. 28		(Exp - 74 Carb) Bast Fibre paper - ends soaked in thick sugar; ~~[illegible]~~
728.	312.		Feb. 24.	4.	Regular loop. New sugared solution are formed and inside globe Bur-steel With high Vacuum
729.	182	136	Feby 24.	6.	Large Loop - Sugared With no 2 Solution;-
730.	295	160	Feby 24		Large Loop - copper plated on shaft of carbon

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
731	155	123	Feby 25		No 5 Sol, Large Loop LN
732	172	135	Feby 25		No 5 Sol Large Loop.
733	242	186	Feby 25		No 4 Sol Large Loop. LN
734	199.	138	Feby 26	4	Regular - Large Loop - Soaked in Standard Sol, -ie- #4
735	199.	137	Feby 26	4	Reg - Large Loop - Soaked in Standard Sol -ie- #4-

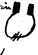
No of Lamp	Before Heating	After Heating	Date	Pump	Notes
736.	197	208	Feby 26	6	Regular Carbon - Standard Solution.-
737.	200.	141	Feby 26	6	Regular Carbon.- Standard Solution.-
738.	1.80.	130.	26.	4.	Regular - sugared
739.	200	144	Feb 26	6	Regular - Sugared
740.	193		Feb 26	6	Regular - Sugared took off the pump could not get a Vacuum cracked

No of Lamps.	Before Heating	After Heating	Date	Pump	Notes
741.	181				Large Loop- Soaked in No 14- Solution.
742.					Large Loop, Standard Sol - #4.
743.	185.	150	Feby 28		Large Loop, Standard Sol,
744.	171.			6	Large Loop. Standard Sol, in side glass Broke on the pump with a high Vacuum
745.					Large Loop, Standard Sol, Broken Carbon at clamp before sent up from glassblower

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
746.	213.	147	Feb 28	6	Standard Sol, Regular Carbons.
747.	255.	200	Feb 28	6	Regular Carbons Standard Solution
748.	250	172	Feby 28	6	Regular Carbon Standard Solution
749.	171.		28.	5	Same.
750.					Same.

No. of Lamp	Before Heating	After Heating	Date	Pump	Notes
751.	223.		Feb. 28.		Large loop, No. 4. Sol.
752.	~~230.~~		~~28.~~		Same Broke before going on the pump it fell and broke the carbon
753.	200	5	Feb 28		Regular carbon Standard Solution
754.	202	167	Mar 2	6	Same.
755.	228.		28	6	Same. Bad Spots in the carbon it did not give a good light

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
756.	211		Feby 28	6	Regular Carbon Standard Solution
757.	225				Regular Carbon Standard So [redacted] Carbon broke when Heated on the pump
758.	227		March 2nd	5	Regular Carbon Standard So
759.					Regular Carbon Standard Solution
760.	205	166	Mar 2	6	Sargaloof Standard Solution. #4.

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
761.	200		Mar. 2		Regular Carbon Standard 80 Vacuum not up to highest on very long & no change so sealed it off per order T.A.E. -H-
762.	210		mar 2nd	5	Regular Carbon Standard So Bad Spot in the Carbon 
763.A	200	160	mar 2	5	Large Loop. *4 Standard Sol,
763.B	229	176	Mar 3	?	Large Loop *4 Standard Sol,
764.	200.		Mch 2.	4	Large Loop, Standard Sol,
765.	223				Large Loop Standard Sol, arc formed at clamp & breaking one bulb oxydyzed the other * 766,

No of Lamps.	Before Heating	After Heating	Date	Pump.	Notes.
766	211				Large Loop No 4 Solution Carbon oxydized by breaking of companion bulb
767.	172	153	mar 3	6	Large Loop No 4 Solution
768.	266	190	mar 3	6	Large Loop No 4 Standard Solution
769.	230.		Mch 2.	4	Large loop. Standard Solution
770.	185	143	mar 2	6	Regulor carbon 4 Standard So

No. of Lamps.	Before Heating	After Heating	Date	Pump	- Notes -
771.	190	153	mar 2	6	Regulr-carbon 4 Standard - Solution
772.					Regular-Carbon 4 Standard So Carbon Broke when he Came to measure it dont know it got Broke
773.A	236	205	March 2		Edison Solution - - Regular Loop. - paper pressed first Soaked & pressed again
773. B	263	181	March 3		Standard Solution #4 Regular Carbon.
774.	232	207	Mar 2		Edison Solution. - Regular Loop - paper pressed before & after soaking
774	250				Bursted on the pump High Vacuum
775.	243	240	Mar 2		Edison Solution - - Regular Loop - paper pressed before & after soaking.

o of Lamp	Before Heating	After Heating	Date	Pump	Notes
776.	876			6	Large Carbon Old Sol (weak) High Resistance coated with strong sol plumbago and sugar coat not previously carbonized Bad spots all over the carbon Bursted on pump
777.	220		march 3 to	5	One Large ~~loop~~ Edison's new Solution Sealed off could not get a Vacuum it was on the pump about 4 hours
778.	35		mar 3	6	Old High ~~Resistance~~ Carbon ~~[illegible]~~ Plumbago Sugar Solution and (11) carbonized (?) Carbon broke on the pump after it was heated a few minutes
779.	212	180	3d	4.	Edison's new sugar and Solution, Large loop.
780.	205	175	3d	4.	Edison's new sugar and Solution, Large loop.

12

80,000
5
400,000
5

2000
6
12000

250 000
8
2,000,000

401 000.
5

28.

2

26,

daily

365
12000
730000
365
4380000

1. 600 000.
365

[illegible]

2 million daily

365
2
~~1000~~) 730,000 ~~000~~ (
730 000
1 000
730,000,000

730 000
6
4,380,000

o of — amp.	Before — Heating	After — Heating	Date.	Pump.	Notes.
			Mch.		Large Loop — Edisons Solution.
781.	175	149.	4.		
782.	240	196.	4.		Large Loop. Edison's Solution.
783.	237	190 [illegible]	mch 4	4	Large Loop Edison's Solution has not got a good Vacuum could not get one
784.	203	173	mch 4	4	Large Loop. Edison's Solution Same as 783 not a good Vacuum
785.	193	157	4.	4	Large Loop. Edison's Solution.

No of Lamp.	Before Heating	After Heating	Date	Pump.	Notes
786.	164		Mch 4.	4.	Tissue paper 24 thicknesses pressed Glass cracked & Carbon broken while being transferred. –
787.	248	176	mch. 4	6	Small Loop .015 paper.
788.	248	176	mar 4	6	Small Loop. .015 paper.
789.	255	187	march 4		Small Loop .015 paper
790.	282	240	march 4	6	Large Loope ~~Standard Solution~~ Carbon No 89. 18 Sheets tissue Pressed Before cutting

Hammer

No of Lamp.	Before Heating	After Heating	Date	Pump	Notes
791.	271.	210.	Mch. 7.	7	Small loop.- 12. sheets tissue, pressed together before cutting.
792.	272	197	Mch 4	6	On new pump. Large Loop ~~Standard Sol~~ 18 Sheet Tissue Paper- Pressed and cut together-
793.	259	213	mar- 4		~~[illegible] Tissue Papers~~ ~~Pressed together.~~ Small Loop Regulos-Carbon
794.	268.	215	5.	7.	Small Loop ~~Regulos Carbon~~ cut from .015 paper pressed to .007
795.	238	190	mar- 4		Small Loop Regulos-Carbon

No. of Lamps.	Before Heating	After Heating	Date	Pump	Notes
796.	294.		march 5th 1880	5	Small Loop. 015 Paper pressed to .007.— a Small Crack in the in side globe and could not get a Vacuum
797.	238.	183	mar 5	5	Small Loop .015 Paper pressed to .007.—
798.	257	200	mch 5	6	Small Loop [illegible] 18 tissue cut and pressed together—
799.	212	170	mch 5	6	Small Loop 12 tissue cut together after Pressing— layers of paper expanded & separated & broke after hanging on wire a short time
800.	235	195	mch 5	5	~~Regular Carbon~~ Large Loop 24 tissue pressed and cut together—

No of Lamp.	Before - Heating	After - Heating	Date	Pump	- Notes -
801.	275	198	Mch 5	5	Large Loop 18 tissue cut and pressed together-
802.	260	196	Mch 5-	4	Large Loop 24 tissue Cut and pressed to gether-
803.	232	189	Mch 5-	4	Large Loop Same as 802
804.	12½				5 Sheets Tissue paper covered on both sides with plumbago & sugar & pressed.- -1 very bright spot- burst at high vacuo-
805.	226		Mch 6	6	the Clamps got and Broke the Carbon High VACUUM ~~Small Loop~~ copper-Plated 015-Paper-pressed to 007

No of Lamps.	Before Heating	After Heating	Date	Pump	Notes.
806	~				Small Loop copperplated .015 Paper. pressed to 007 Broken in glassblow
807.	304		mch 6	6	Small Loop Copperplated 015 paper. Pressed to 007 Small crack on the inside globe could not get a Vacuum
808.	8.000	6.900	mch 7	6	one fiber of Jute With copper ends
809.	250		7	6	2 Small Loops —015 small. paper pressed to 007 ends copper plated
810.	259		7	6	Same as above

No of Lamps	Before Heating	After Heating	Date	Pump	Notes
811.	500		7	5	Manilla Fiber Ends copper-plated Carbon Exp. 122
812.	449		7	5	Manilla Fiber ends copperplated Carbon Exp 122
813.	217	190	mch 8	4	Small Loops .015 & uncal. paper pressed & .007 ends copper plated Bright Bad spot at centre of curve
814.	222	165	8	5	Small Loop .015 uncal paper Pressed to .007 ends copperplated
815.	199	156	mch 8	4	Small Loops .015 uncal. paper pressed ~~&.007~~ ends copper plated Bright ~~Bad spot~~ in side

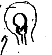
No of Lamp.	Before Heating	After Heating	Date	Pump	Notes.
816.	20		mch 8	6	Jute (fiber-) 2ª number coppered Bad connection at clamps. fiber divided into 1/2 doz strands at clamp, - Bust at clamp soon after heating.
817.	95	87	mch 8	6	Bass fiber coated with Plumbago and sugar- coppered.
818.	2000		mch 8	4	manilla fiber coppered Arc formed at the clamp
819.	2,500		mch 8	4	manilla fiber coppered it had bad spots in the carbon and gave a very poor light and the carbon busted after burning about five hours
820.	345		mch 8	6 Arc formed at clamp	~~1 Leaf of ([illegible])~~ ~~tissue papers 19 in squares with thin Plumbago and sugar solution in between each~~ Jute fiber stuck together by lighting them in the mould and drawn through the fingers

192

193

No of Lamps.	Before Heating	After Heating	Date	Pump.	Notes
821.	265		mch 8	7	~~Ramie fiber wet and dried stuck together~~ Jute fiber stuck together By Weighting them in the mould and drawn through the fingers Carbon broke on the pump run 10 minutes
822.	252		mch 8	5	Jute fiber stuck together By Weighting them in the mould and drawn through the fingers It Busted on the pump with a high Vacuum by TAE
823.	330.		mch 9	5	Fibre from Palmetto Leaf Carb, 133. Arc formed at Clamp and broke the Carbon With a high Vacuum
824.	225.				Fibre from Palmetto Leaf. Carb – 133. the inside globe Busted on the pump With high ~~Vacuum~~
825.	243	198.			Palmetto Leaf Carb – 133 –

No of Lamp.	Before Heating	After Heating	Date	Pump.	Notes
826.	222	98			Wire grass - Carb 127 - copper-plated - very brittle
827.	122	87	mch 9.	5	Small loops -.015 Paper soaked in Sulphate of Ammonia pressed to .007 - coppered -
828.	144	87	mch 9	5	Small loops .015 Paper soaked in Sulphate of Ammonia pressed to .007 - coppered -
829.	146	85	mch 9	~~5~~ ~~4~~ 6	Small Loops .015 paper soaked in Sulphate of Ammonia and pressed - coppered -
830.	112	83			Small loops - .015 paper soaked in Sulphate of Ammonia and pressed to .007 - coppered -

No of Lamp.	Before-Heating	After-Heating	Date	Pump	Notes
831.	142	84			Small loop .015 paper soaked in Sulphate of Ammonia pressed to .007 — coppered —
832.	137	81			Small Loop .015 paper soaked in Sulphate Ammonia pressed to .007 — coppered —
833	313				Palmetto Leaf Fibre — Coppered — Carbon loosened in clamp & formed arc after it slipped through the clamp — as 
834.	998		mch 9	6	Manilla Fibre .007 — Coppered —
835	510		9.	7.	Manilla fibre. about .007 coppered

No of Lamp.-	Before Heating	After Heating	Date-	Pump.-	-Notes-
836.	525		Mch 9.	7.	Manilla fibres, about .007 Coppind.
837.	397.				Manilla Fiber about .007 - Coppered carbon burnt off after heating gradually for some time with good vacuum
838.	397.				Manilla Fiber about .007 = Coppered Carbon burnt off same as previous No -
839.	123	83	mch 9	4	Small Loop uncal 015 Paper - soaked in Sulphate ammonia and Pressed to 007 Coppered
840.	146	88	mch 9	4	Small Loop uncal 015 paper - soaked in Sulphate ammonia and Pressed to 007 Coppered

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
841.	600		mch 9	6	Manilla fiber .007 thick. sided copperplated. Arc formed at clamp and broke the carbon
842.					
843.	51.		mch. 9.	6.	Palmetto leaf, Coppered.
844,	36			7	Palmetto Leaf Coppered. Bursted on the pump With a good Vacuum the clamp got Red hot and broke the Lamp
845.	306.		9.	6.	Two threads Sealed off with high vacuum too high resistance to more than glow.

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
846.	85	80 about	mch 9	5	Wire grass from florida Coppered Sealed off and given to T.A.E. experiment - good vacuum Broken at the clamps
847.	94		mch 9	5	Wire grass from Florida Coppered
848.	219	184	mch 11	7	Palmetto Leaf. - Coppered -
849.	219			7	Palmetto Leaf. - Coppered - Carbon broken at clamps taken out to put in a new bulb,
850.	224				Small Loop soaked in starch and H^2O and pressed ÷ carb 104 -

No. of Lamp.	Before Heating	After Heating	Date	Pump	Notes.
851.	230				Small loop soaked in starch and H_2O and pressed - carb, 154
852.	225				Small Loop soaked in starch and "H_2O" and pressed - carb 154. Bad Spots in the carbon
853.	221				Small Loop soaked in starch and H_2O and pressed - carb-154
854.	60				Palmetto Leaf. —Coppered.— Broke the Same as 855
855.	54				Palmetto Leaf. - Coppered - Strands were disintegrated when put on pump and at first heating separated - poor fiber -

No of Lamp	Before Heating	After Heating	Date	Pump	Notes.
856.	63.	50			Palmetto Leaf, - Coppered - Same as previous no - very poor fibre —Noticed the break was just above the copper plating —
857.					Small Loop .015 soaked in Sulphate of Ammonia + pressed Broken at Glassblowers, while putting on stock
858.	136		mch 11	4	Small Loops
859.	117	84	mch 11	4	Small Loops —
860.	250				Small Loop .015 Soaked in Sulphate of Ammonia and pressed. Carbon broke just before sealing off — very good vac, high resistance carbon.

No. of Lamp.	Before Heating	After Heating	Date	Pump	Notes
861.	221, 83				Small Loop .015 Soaked in Sulphate of Ammonia and pressed.
862.					Small Loop .015 Soaked in Sulphate of Ammonia + pressed.
863.	186		mch 13	6	Small Loop of .015 Soaked in Sulphate Ammonia and pressed
864.	209		mch 13	6	Small Loop of .015 Soaked in Sulphate Ammonia and Pressed
865.	181		mch 13	6	Small Loop of .015 Soaked in Sulphate Ammonia and Pressed

No of Lamp.	Before Heating	After Heating	Date	Pump	Notes
866.	181		mch 13	new pump	Small Loop of 015 soaked in sulphate Ammonia and Pressed
867.			mch 20		Bass fiber-Small copper-Plate ends
868.			mch 20.		Bass fiber-Small copper-Plate ends
869.	136	90	mch 13	4	Small Loop of 015-Soaked in Sulphate Ammonia and pressed on for about ten hours and could not get high vacuum
870.	193	97	mch 13	4	Small Loop of 015 soaked in Sulphate Ammonia and pressed on the pump for about ten hours and could not get a high vacuum

~~871 [illegible] 878~~

Number -of- Lamps	Before -Heating	After -Heating	-Date-	Pump	-Notes-
871.					Small Loop Soaked in Sulphate of Ammonia + pressed Broken by Glassblower.
872.	286	85	mch 13	Crw pu	Small Loop of 015 Soaked in Sulphate Ammonia and pressed
873.	155	97	mch 13	Crw pmp	Small Loop of 015 Soaked in Sulphate Ammonia and pressed
874	170	92	mch 13	men pmp	Small Loop of 015 Soaked in Sulphate Amonia and Pressed two Bad spots in the Carbon Glass busted arc in one minute
875.	195		mch 13.	men pmp.	Small Loop of 015 Soaked in Sulphate Ammonia and Pressed

No of Lamps	Before Heating	After Heating	Date	No of Pump	Notes
876	164		mch 13	4	Small Loop of 015 Soaked in Sulphate Ammonia and Pressed
877	178		mch 13	7	Small Loops 015 Soaked in Sulphate Ammonia and Pressed Sealed off by order of Mr Batchelor
878	241	mch 13	mch 13		Small Loops of 015 Soaked in Sulphate Ammonia and Pressed Bad Spot in the Carbon
879	187		mch 13	7	Small Loop 015 Soaked in Sulphate Ammonia and Pressed Sealed by order from Mr Batchelor
880	177	[illegible]	mch 13	new pump	Small Loop of 015 Soaked in Sulphate Ammonia and Pressed Bad Spot in the Carbon

No of Lamps	Before Heating	After Heating	Date	No of Pump	Notes
881	174		mch 13	4	Small Loop of 015- Soaked in Sulphate Ammonia and Pressed
882	420	242	mch 14	4	Small Loop 015- Soaked in Aniline oil and Pressed Bad Spot in the carbon
883	355	204	mch 14	4	Small Loop 015- Soaked in Aniline oil and Pressed
884	440	253	mch 13	4	Small Loop 015- Soaked in Aniline oil and Pressed
885	160	85	mch 13		Small Loops ~~015~~ ~~Soaked in Sulphate~~ ~~Ammonia~~ ~~Pressed~~ Soaked in Tragacanth

No of Lamps	Before Heating	After Heating	Date	No of Pump	Notes
886	235	197	mch 14	8.	Small Loop 015 unpressed to 007 treated with Hydroflouric acid and Plated with copper
887	260	231	mch 14	4	Small Loop of unpressed Pressed to 007 treated with Hydroflouric acid and Plated with copperd
888	450	287	mch 14	4	Small Loops 015 unpressed Soaked in Tar dissolved in Kerosene Copperd
889	370		mch 14	6	Small Loops 015 unpressed Soaked in Tar dissolved in Kerosene copperd the Carbon Broke on the first Heating
890	162		mch 14	6	Small Loops 015 naphthaline dissolve in Bi-sulph Carbon and Pressed to 007 Copperd ~~the~~ [illegible] it Broke the Carbon and [illegible] on [illegible] Heating

No of Lamp	Before Heating	After Heating	Date	No of Lamp	Notes
891					
892	210	92	mch 14	8	Small loops 015 - naphthaline disolved in Bisulp Carbon and pressed to 007 Copper-
893					
894					
895					

No of Lamps	Before Heating	After Heating	date	No of Pumps	Notes
896					
897					
898					
899					
900					

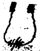
No of Lamps	Before Heating	After Heating	Date	Pump	Notes
901					
902					
903	410	201	Mch 16	4	Small Loops 015 Soaked in Aniline oil and Pressed
904	410	214	Mch 16	4	Small Loops 015 Soaked in Aniline oil and Pressed

No of Lamp.	Before Heating	After Heating	Date	Pump	Notes.
905	360	191	Mar 16		Small Loop .015 soaked in Analine Oil and pressed
906	220	176	Mar 16		Small Loop uncalendered paper soaked in resin dissolved in alchohol & pressed.
907	225	213	Mar 16		Small Loop unpressed soaked in Anthracine in Turpentine and pressed .007
908	220		Mar 16		Same as 907- accidently broken by Jehl

No. of Lamp.	Before Heating	After Heating	Date	Pump	Notes
909.	13		mar 16	4	first Pressed Plumbago Small Loop from new mould made By Dean time paper on both sides It Broke at first Heating
910	[illegible]		mch 16	4	first Pressed Plumbago Small Loop from new mould made By Dean time paper on Both sides Broke on the pump.
911.	500		17		Selected Fibre. Manilla High Resistance. ~~Small [illegible]~~ Small crack on the inside Globe and sealed off Pump
912.	780	500	17	8	Selected Carbonized Manilla Fiber High Res,
913.	840	650	17		Selected Fiber. Manilla High Res,

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
914.	200	152	Mch 17	8	.005 Uncalendered paper soaked in resin & alcohol & pressed to .007.
915.	93				1 Small Fiber Wire Grass carb 127. Black Deposit (H.C) on bulb while heating. Carbon broke at clamps after heating some time very low resistance.
916	156	111	Mar 17	8	Bass Fiber coated with Plumbago & sugar Carb 161
917.	465				Manilla Fiber (Picked) Carb 162
919	516	344			Manilla Fiber selected, Carb, 162

No of Lamps	Before Heating	After Heating	Date	Pump	Notes
918.	1297	750	mch 1-8		Selected Manilla Fiber Carb 162
919 previous page 920.	790	475	19	8	Selected Manilla Fiber Carb 162 very high resistance does not shine brightly
921.	1135	848	mch 18	8	Manilla fiber - Carb 162 coppered
922	1300	848	mch 18	8	Manilla fiber - carb 162 coppered
923	800	570	mch 18	4	Manilla fiber - Carb 162 coppered Bad Spot in Carbon



No of. Lamp	Before Heating	After Heating	Date	Pump	Notes
924	1800	1290	mch 18	4	Manilla fiber - carb 164 Coppered
925	688	450	mch 18	8	manilla fiber - carb 164 Coppered
926	170		mch 18	8	cocoa nut fiber carb 164 Picked coppered ends Arc formed at the clamp and Broke the Carbon
927	[illegible]	125			- Selected Cocoanut Fibers - - Coppered Ends - - Carb, 164 -
928	480	340			- Selected Cocoanut Fiber - Coppered Ends - - Carb - 164 -

W. J. Hammer

No of Lamps.	Before Heating	After Heating	Date	Pump.	Notes.
929.	183	115	mch 19		Acetic Acid Sol pressed to .007 Small Loop Could not get a high Vacuum
930.	199	117	mch 19		Same as 929
931.	72				Wire Grass copper Ends
932	274				Small Loop Geletine Solution pressed .015 to .007 Copper plated Ends.
933.	322				same Nickel Ends

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
934	810				Same as previous
935	67		Mch 19	8	Silver plated Ends. Crack found at annealing point when came from G. B's sealed from stock, put in new bulb Small Loop Molasses Solution 015 Pressed to 007
936	88	66	Mch 19		Small Loop carb 174 Molasses Solution 015 Pressed to 007
937	66		Mch 19		Small Loop carb 174 molasses Solution 015 Pressed to 007. Broke on the pump the first heating
938	74		Mch 19		Small Loop carb 174 molasses Solution 015 Pressed to 007

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
939	87		mch 19		Small Loop Cast 174 molasses Solution 015 Pressed to 007
940	97		mch 19	4	Small Loop molasses - Solution 015 Pressed to 007
941	97		mch 19	4	Small Loop molasses Solution 015 Pressed to 007
942	74		mch 19	8	Small Loop molasses Sution 015 Pressed to 0.07
943	76		mch 20		Small Loop Cast 174 molasses Solution 015 Pressed to 007

No of Lamp	Before Heating	After Heating	Date	Pump	Notes
944	63		mch 20		Small Loop Carb 174 molasses Solution 015 Pressed to 007 Glass cracked at wires sealed off pump —
945	72		mch 20		Small Loop Carb 174 Molasses Solution 015 Pressed to 007
946	54		mch 20		Small Loop Carb 174 molasses Solution 015 Pressed to 007
947	78		mch 20		Small Loop Carb 174 molasses Solution 015 Pressed to 007
948	67		mch 20		Small Loop Carb 174 molasses Solution 015 Pressed to 007 Broken at Glass Blowers after sealed off all OK

No of Lamps	Before Heating	After Heating	date	No of Pumps	Notes
949	51		mch 19		Small Loop Carb 174 molasses Solution 015 Pressed to 007 Crack in the out-side Bulb Could not get Vac
950	87	69	mch 20	4	Wire grass Plumbago Ends
951	95	84	mch 20	4	Wire grass Plumbago ends
952					
953	560	386	mch 21		Cocoanut fiber Nickel Copper Ends

244

14 9 6 7 0 0 8
2 9 8 3 4 0 6 6 25
5 9 6 6 8 0 3 2 26
1 4 2 3 6 0 6 4 27
2 3 5 4 7 2 1 2 8 28
5 7 0 9 4 4 2 4 6 29
11 4 1 8 5 8 2 1 2 30
2,2 5 3,7 7 6,2 2 4 31

1,0 0 0,000,000,000,000,000,000

249

Number of Lamp	Before Heating	After Heating	Date	Pump	Notes
954	435		mch 21		fibers from the young Palmeto Leaf copper Ends Carbon Broke at the Clamp at first Heating
955	350		mch 21		fibers from the young Palmeto Leaf copper Ends Carbon Broke at the Clamp at the first Heating
956	355		mch 21		fibers from the young Palmeto Leaf Plumbago Ends Broke the carbon at the first Heating
957	111		mch 21		Black moss from florida with Joints in it Copper Plate Ends Broke the Carbon at the first Heating
958	[illegible]		mch 22		Black moss from florida with Joints in it copper Plate Ends Broke the carbon at the first heating

Number of Lamps	Before Heating	After Heating	Date	Pump	Notes
959	550	294	mch 20		cocoa nut fiber- Picked Bad Spot in the side of Carbon
960	104		mch 21		Cocoa nut fiber- Picked Copper ends
961	615	486	mch 21		Cocoa nut fibers- Picked Cost 164 copper ends
962	450	229	mch 20		cocoa nut fiber- Picked
963	[illegible]		mch 21		~~cocoa nut fiber Picked~~ Black mass from [illegible]

Number of Lamp	Before Heating	After Heating	Date	Pump	Notes
964					
965	615		mch 21		fibers - from the young Palmetto Leaf Carb 172 Silver Plate ends Broke at the first heating
966					
967	87		mch 20		Bass fiber - Small copper Plate ends Bad Spot on carbon at clamp Sealed JB.—
968	137	93	mch 20		Bass fiber - Small copper Plate ends

Dear Sir

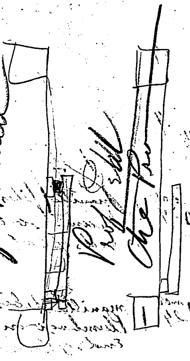
H

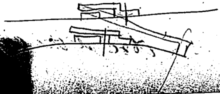
Dear Sir-

Number of Lamp	Before Heating	After Heating	Date	Pump	Notes
969	~~550~~		mch ~~20~~ 24	8	~~manilla fiber~~ ~~[illegible]~~ carbon broke on the Pump
970	995		mch 24	8	manilla fiber- Plumbago on the Ends of carbon
971	720		mch 24	1	manilla fiber- Plumbago on the Ends of carbon
972	720		mch 24	1	manilla fiber- Plumbago on the Ends of carbon
973	750		mch 24	4	manilla fiber- Plumbago on Ends of carbon Arc at the clamp

Prof Wilson Howell

Prof Howell


Prof Still
Che Pro
770 99



100
100
10000
44
40000
40000
~~100)440000~~

100
100
10000

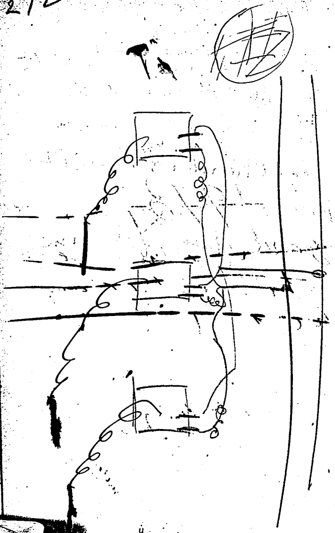
100

10000
44

Last Number — in the ~~book 4070~~ good ~~day~~ Hammes –

300) 440000 (1466
3
14
12
24

3810



8.18

8.22 c.w.o. no change

8.36 a fall 4 mill current taken off

9. current put on

9.15 $\overset{250}{\underset{850}{\text{fall}}}$ 15 mill . C Taken off

9.35 current put on. 11 mill from top,

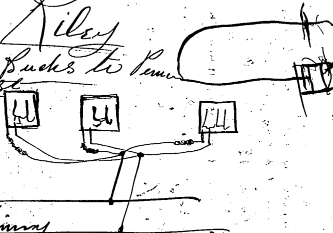
Engine stop. Pump kept on Pumping

~~Temp 45°; Burnt lower house and then got Broke with a fall on the floor~~

Francis Jehl
New york City

Electrometer
Dynamometer

John J. Riley
Bristol Bucks Co Penn
25 Baltic St



J. P.

P. T. Kinny
282 8th Ave New York City

Electric Light

Electric Light

Electric Light

3925) 33000.0 (8.4
31400
26000

4338
640

4330) 33000.0 (7.6
30310
26900

22

3.0310

124890

42) 184890 (3925

2980

250

164880

(4330

138

129

(10) $\frac{189}{32811}$ per [illegible]

3.2811) 33
328
189

John

Finney

90
90
8100
44
32400
32400
356400

5

$\frac{356400}{1}$ $\frac{2}{5}$ 5) 712800 (142560

$2\frac{1}{2}$ $\frac{5}{2}$

2) 142560

$\frac{142560}{1}$ $\frac{10}{3}$

10) 1425600
47520
1378080 by [illegible]

2.5

3) 1425600
47520 [illegible]

(32811

32811 by [illegible]

1.2 $\frac{2}{3}$ 1 $\frac{62}{76}$ 5 90 / 90

.62
.62
124

2

90
90
8100
44
32400
32400
3564001

.62
124
.3844

$\frac{5}{6}$ 6) 1.9220

4 2
.3203

156000

.52
1).25

4 / 2 / 6 / 1 / 8 / 9

1. $\frac{80}{100}$ $\frac{100}{80}$

9
10
12
9
21

$\frac{24}{27}$

27
15
42

1

$1\frac{1}{4}$ $\frac{42}{80}$ 42) 300 / 42 (7.9
38
42 | 19

2.0

2.3

2.05

42) 380 / 378 (.9

4

142560
47520
42) 35000) 1 05040 (2500 by [illegible]
84
210
210

1

2500) 35000 (

$$\frac{\varepsilon s}{r(s+(p+q)) + s(p+q)}$$

$$\frac{\varepsilon s}{rs + (r+s)(p+q)}$$

$\frac{18}{4}$ $\frac{1}{4}$

$\frac{4}{4}$

$\frac{18}{16}$

$$\frac{\frac{\varepsilon s}{sp+qs}}{pq+qs}$$

$$\frac{\frac{\varepsilon s}{sp+qs}}{pj+qg}$$

$$r+\frac{s}{ps^2+q}$$

$$\xcancel{r+\frac{\frac{(p+\varepsilon)}{s(p+q)} \times \frac{(s+)}{(s+(p+q))}}{s+(p+q)}}$$

$$\cancel{r+\frac{\frac{\varepsilon}{s(p+q)}\times\frac{s}{s+(p+q)}}{s+(p+q)}}$$

$$r+\frac{\frac{\varepsilon}{s(p+q)}\times\frac{s}{s+(p+q)}}{s+(p+q)}$$

$$r+\frac{\frac{\varepsilon s}{s(p+q)^2}}{s+(p+q)}$$

$sp+qs$
$sp+qs$

$$r+\frac{\frac{\varepsilon}{sp+qs}\times\frac{s}{s+(p+q)}}{s+(p+q)}$$

$$r+\frac{\frac{\varepsilon s}{sp+qs}}{s+(p+q)}$$

$$\frac{\frac{2}{3}}{4}$$

$$r + \frac{\frac{E}{S(p+q)}}{S+(p+q)} \times \frac{S}{S+(r+q)}$$

4

3)260 20

86

1 ~~86~~ 3

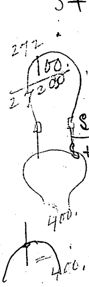
21 4

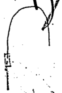
688

272

100

27200





$$\frac{Sp + Sq}{S + p + q} \Big| \begin{array}{l} Sp + Sq \\ Sp + p^2 + pq \end{array} \quad (p+q$$

$$\begin{array}{l} Sq - p^2 - pq \\ Sq + \quad pq + q^2 \\ \hline - p^2 - q^2 \end{array}$$

400

400 20

200

1400 600) 3810 (272

2635 544

1 8

98 1400 (

635 30 272

28 5

272 20 1360

80 c 192

272

80

192

Thos A Edison

Chas Batchelor Menlo Park New Jersey

$$r + \frac{\frac{E}{S(p+q)}}{S+(p+q)} \times \frac{S}{S+(p+q)}$$

Chas

Chas Batchelor

r E

Chas Boose

Roxf 208 Bristol

Penn

$$r + \frac{\frac{E}{S(p+q)}}{S+(p+q)} \times S+(p+q)$$

$$r + \frac{s}{1+1} \times \frac{1}{S+(p+q)}$$

$$\frac{\frac{c}{1}}{1+1} \times \frac{1}{(p+q)}$$

Geo Hill Carmen

mas

Metuchen Carmen

28160 2

New Jersey 7) 56320 (8045

4 3 mil at 3 o'clock

Hill

Hill

sp + sq

4) 140000
35000

1 5

s + p + q) sp + sq
sp + 0

sp + sq

s + p + q) sp + sq (p + p
sp + p² + pq
− p² + sq − pq

260
3) 270
9

George Hill Swanson

Swanson

Swanson Herrick Swanson

Albert

Herrick R Reistand

Manuel

$1\frac{2}{3}$ .56
.66
1.22

$\frac{1}{1}$ $\frac{100}{60}$

22

$\frac{60}{100}$

$\frac{10}{100}$

$\frac{10}{100}$

John Riley

New York